

## THE GENUS CRATAEGUS IN NEWCASTLE COUNTY, DELAWARE.

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THESE notes are based on collections and observations of the genus *Crataegus* made during the last three years in Newcastle county, Delaware, by Mr. W. M. Canby.

CRUS-GALLI.

*Stamens 10.*

CRATAEGUS CRUS-GALLI Linnaeus.—Near Wilmington the typical form of this species is common. It is a glabrous tree with wide-spreading branches, obovate coriaceous leaves with the primary veins mostly within the parenchyma, 10 stamens, bright rose-colored anthers, and sub-globose or short-oblong dull crimson fruit which often remains on the branches late into the winter or until spring. The leaves on short lateral branches are clustered and erect, while the long and numerous spines mostly point downward. In the middle states, however, there are many perplexing forms of this species; some have more or less hairy corymbs; of others the fruit varies in size, shape, and brightness of color; of others the leaves are thinner, nearly always acute and sharply serrate, with more prominent veins, and occasionally individuals are found nearly destitute of thorns. Some of the most distinct of these varieties may be characterized as follows:

CRATAEGUS CRUS-GALLI *oblongata*, n. var.—Fruit oblong, often 2.5<sup>cm</sup> in length, rather brighter colored than the fruit of the type; nutlets 1 or 2, acute at the ends, prominently or often only slightly ridged on the dorsal side, 10 to 11<sup>mm</sup> long.

Meadow near Edgemoor, *W. M. Canby*, September 30, 1899, June 3, 1901; Pennsylvania, Dunham, Bucks county, *C. D. Fretz*, October 1901, September 1902.



*CRATAEGUS CRUS-GALLI PYRACANTHIFOLIA* Ait. Sargent, Silva N. Am. 13: 39. *t.* 637.—In this form the nutlets are also often solitary and are more acute than those of the typical form. Common.

*CRATAEGUS CRUS-GALLI capillata*, n. var.—Leaves oblong-obovate, rounded or acute at the apex, finely serrate, thin but firm in texture, lustrous on the upper surface, pale on the lower surface, about 3.5<sup>cm</sup> long, 1.5 to 2<sup>cm</sup> wide. Flowers small, rarely more than 8–10<sup>mm</sup> in diameter, in many-flowered slightly villose corymbs; stamens 10; anthers pale rose color; styles usually 1, rarely 2. Fruit subglobose to short-oblong, green slightly blotched with red; nutlets 1, rarely 2, obtuse at the ends, prominently ridged, 8 or 9<sup>mm</sup> long, nearly as thick as long.

A tree 3–4<sup>m</sup> in height, with a trunk covered with dark rough bark, spreading branches, and slender nearly straight branchlets villose when they first appear, bright chestnut-brown and lustrous during their first season, becoming reddish-brown the following year, and armed with slender slightly curved bright chestnut-brown ultimately gray spines 3–6<sup>cm</sup> long. Flowers during the first week of June. Fruit ripens toward the end of October and soon falls.

In woods one mile east of Christiana on the Newcastle road, *W. M. Canby*, June 1 and October 16, 1901, May 31, 1902. A specimen in flower collected by Mr. Canby in a meadow at the head of the Wissahickon Drive, Germantown, Pennsylvania, appears to belong to this variety.

*CRATAEGUS CANBYI* Sargent, Bot. Gaz. 31: 3. 1901; Silva N. Am. 23: 41. *t.* 638.

*Stamens 20.*

*Crataegus Pennypackeri*, n. sp.—Leaves obovate, acute and often short-pointed at the apex, gradually narrowed and cuneate at the entire base, finely serrate above, with straight or slightly incurved gland-tipped teeth, glabrous, membranaceous until after the petals fall; at maturity subcoriaceous, dark green and lustrous above, pale yellow-green below, 3.5–4<sup>cm</sup> long, about 2<sup>cm</sup> wide, with pale light yellow midribs and primary veins impressed on the upper surface and raised and prominent below; petioles slender, grooved, winged above by the decurrent base of the leaf-blades, 8–10<sup>mm</sup> long; leaves on leading shoots mostly rhombic, short-pointed, more or less deeply divided into broad acute lateral lobes, 8–9<sup>cm</sup> long, about 7<sup>cm</sup> wide, their stout



petioles wing-margined, 7-8<sup>mm</sup> long, rather shorter than the foliaceous lunate acuminate coarsely glandular-serrate stipules. Flowers in compact many-flowered thin-branched compound corymbs covered with long scattered pale caducous hairs; calyx-tube narrowly obconic, the lobes narrow, acuminate, entire or occasionally obscurely glandular-serrate, reflexed after anthesis; stamens 20; styles 3-5. Fruit oblong, full and rounded at the ends, bright crimson marked by numerous large pale dots, 1-3<sup>cm</sup> long, 8-12<sup>mm</sup> wide; calyx prominent with a short tube, a broad deep cavity, and lanceolate lobes abruptly narrowed from broad bases, appressed; flesh thin, greenish, dry and mealy; nutlets 3-5, thick, obtuse, prominently ridged on the back, with a broad rounded ridge, 9-10<sup>mm</sup> long.

An arborescent shrub 4-5<sup>m</sup> high, with spreading branches and slender nearly straight or slightly zigzag branchlets marked by large oblong pale lenticels, pale yellow-green at first, light red-brown and lustrous during their first season, becoming gray-brown in their second year, and armed with many stout straight or slightly curved spines 5-6<sup>cm</sup> long. Flowers from the middle to the end of May. Fruit ripens toward the end of September and in the beginning of October.

Banks of the spillway of Dean & Pillings's mill south of Stanton Station, *J. T. Pennyacker*, May 31, 1902, *W. M. Canby*, June 28 and Sept. 27, 1902.

PRUINOSÆ.

*Stamens 20.*

CRATAEGUS PRUINOSA K. Koch, Sargent, *Silva N. Am.* 13: 68. *t. 648.*

Hedges, Eden Park, Wilmington, May and October 1899, May 1900, Elliott's Hill near Wilmington, October 1899; fields near Wilmington, May 1900; race bank below Stanton, September 1902; fence rows near Wilmington, September 1902, *W. M. Canby*. Common.

CRATAEGUS ARCANA Beadle, *Biltmore Bot. Studies* 1<sup>2</sup>: 122. April 1902.—Except by its slightly smaller flowers, I cannot distinguish from *Crataegus arcana*, of the elevated regions of western North Carolina, a common shrubby thorn of northern Delaware and eastern Pennsylvania, with thin leaves cuneate at the base except on vigorous shoots, twenty stamens, pale rose or light purple anthers, and fruits often obconic at the base and conspicuously swollen or mamillate below the middle.



Wood borders opposite Farnhurst, *W. M. Canby*, May, September, and October 1900; Pennsylvania, Chadsford, Chester county (with larger fruit), *W. M. Canby* and *B. H. Smith*, October 8, 1902; Sellersville, Bucks county, *C. D. Fretz*, May 1898, October 1899, May and September 1900, May 1901.

*Stamens* 10.

Anthers yellow.

***Crataegus delawarensis***, n. sp.—Glabrous. Leaves rhombic to ovate, acute, gradually narrowed below from near the middle or on vigorous shoots broadly cuneate at the entire base, divided above into three or four pairs of short acute lateral lobes and finely and sometimes double serrate, with gland-tipped teeth, membranaceous, light yellow-green on the upper surface, paler below, 5–6<sup>cm</sup> long, 4–5<sup>cm</sup> wide, with slender light yellow midribs and 3 or 4 pairs of thin primary veins arching to the points of the lobes; petioles slender, slightly wing-margined at the apex, grooved, glandular at first, with few small dark red deciduous glands, 2–3<sup>cm</sup> long; stipules linear, acuminate, coarsely glandular-serrate, reddish, caducous. Flowers about 1.5<sup>cm</sup> in diameter on slender pedicels, in 5–8-flowered compact thin-branched compound corymbs; bracts and bractlets oblong-obovate to linear, acute, glandular-serrate, reddish; calyx-tube narrowly obconic, the lobes broad, acuminate, coarsely glandular-serrate, reflexed after anthesis; stamens 10; anthers pale yellow; styles 3 or 4, surrounded at the base by a narrow ring of pale tomentum. Fruit in few-fruited erect clusters, subglobose, rather broader than high, obscurely angled, gradually narrowed below to the stout petiole, dark red, not pruinose, 1.1–1.2<sup>cm</sup> broad; calyx sessile, with a broad shallow cavity and lobes gradually narrowed from broad bases, acute, closely appressed; flesh thin, green, dry and mealy; nutlets 3 or 4, thick, full and rounded at the ends, prominently ridged on the back, with a high rounded ridge, 7<sup>mm</sup> long.

A slender shrub 1–2<sup>m</sup> high, with erect stems and thin nearly straight branchlets at first light green, dull red-brown and marked by occasional large oblong dark lenticels during their first year, light gray-brown in their second season, and armed with few very slender straight or slightly curved dark red-brown spines 3–4<sup>cm</sup> long. Flowers the end of May. Fruit ripens toward the middle of October and mostly falls before the end of the month.



Wood borders. Rare. Between Newport and Newcastle, *W. M. Canby*, September 1899, May and October 1900.

A well marked species in the *Pruinosa* group, distinguished by the pale yellow anthers of the 10 stamens, by the absence of a calyx-tube from the mature fruit, and by the thinness of the leaves.

#### INTRICATAE.

***Crataegus apposita*, n. sp.**—Leaves oblong to oval, acute, acuminate or rarely round at the apex, cuneate at the base, glandular-serrate, above the middle usually doubly, with spreading teeth, below with small incurved teeth, or often entire near the base, slightly and irregularly lobed toward the apex, with short acute lobes; as they unfold coated above with soft pale deciduous hairs, at maturity thin but firm in texture, dark yellow-green on the upper surface, paler on the lower surface, 3.5–4<sup>cm</sup> long, 2–3<sup>cm</sup> wide, with slender 2–4 thin remote primary veins extending obliquely to the points of the lobes; petioles slender, wing-margined above, at first villose, soon glabrous, glandular with small scattered dark red glands, often red toward the base, 1.5–2<sup>cm</sup> long; stipules oblong-obovate to linear, conspicuously glandular-serrate, caducous, leaves on vigorous shoots often ovate, acute, broadly cuneate and abruptly narrowed at the base into the wide wing of the short stout petiole, coarsely serrate, deeply 3–5-lobed, 5–6<sup>cm</sup> long, 4–6<sup>cm</sup> wide, their stipules foliaceous, lunate, coarsely glandular-serrate, 7–10<sup>mm</sup> long. Flowers 1.5<sup>cm</sup> in diameter on slender pedicels, in few usually 4–7-flowered glandular compound corymbs; bracts and bractlets oblong-obovate to linear, conspicuously glandular-serrate, turning red before falling, caducous; calyx-tube broadly obconic, glabrous, the lobes gradually narrowed from broad bases, acute, glandular-serrate, slightly hairy on the inner face, reflexed after anthesis; stamens 10; anthers pale yellow; styles usually 3. Fruit in drooping clusters, oblong-obovate, full and rounded at the apex, gradually narrowed below into the stout petiole, green until late in the season, then reddish or green more or less blotched with red, or occasionally when fully ripe light red or rarely yellowish-bronze color; calyx-tube elongated, prominent, with a deep narrow cavity, and spreading and appressed lobes coarsely serrate toward the apex; flesh thin,



yellow-green, dry and mealy; nutlets usually 3, broad, obtuse at the ends, rounded and prominently ridged on the back, with a wide rounded ridge, 8-9<sup>mm</sup> long.

A thin-stemmed shrub usually 1-2<sup>m</sup> high, rarely taller and almost arborescent in habit, with slender spreading branchlets yellow-green tinged with red when they first appear, bright red-brown or purple-brown and marked by few large pale lenticels during their first season, becoming dark gray-brown or reddish-brown the following year, and armed with numerous very slender bright chestnut-brown spines mostly 4-6<sup>cm</sup> long. Flowers the middle of May. Fruit ripens about the 10th of October.

Wilmington, May 13, 1899; banks of Brandywine creek above Thompson's Bridge, May 16, and September 23, 1899; north side of Bancroft's Dam, near Wilmington, and Rockford Park, Wilmington, October 9, 1899; banks of Brandywine creek, near Wilmington, May 16, 1900, *W. M. Canby*.

Very closely related to *Crataegus intricata* Lange, a common New England species, this Delaware thorn can be separated from it by the shape of the deeply lobed leaves of vigorous shoots, by the somewhat smaller size, and the color of the fruit, by the elongated tube of the mature calyx, by the more tree-like habit of some individuals, and by its more numerous and more slender spines.

***Crataegus nemoralis*, n. sp.**—Leaves ovate to oval, acute, gradually or abruptly narrowed, slightly divided above the middle into acute lobes coarsely and except toward the base mostly doubly serrate with incurved glandular teeth, tinged with red when they unfold, and covered with long pale caducous hairs on the upper surface, and pale blue-green and sparingly villose on the lower surface, glabrous when the flowers open; at maturity thick and firm, dark green above, paler below, 4-5<sup>cm</sup> long, 3-4<sup>cm</sup> wide; on leading shoots broader, full and rounded at the base, and often deeply lobed; petioles slender, slightly grooved, at first villose-pubescent, soon glabrous, glandular with small scattered dark persistent glands, 1.5-2<sup>cm</sup> long; stipules linear, lobed at the base, villose, coarsely glandular-serrate, early deciduous. Flowers 1.4<sup>cm</sup> in diameter, on slender pedicels in compact few-flowered thin-branched glabrous compound corymbs; bracts and bractlets oblanceolate to linear, acuminate, closely glandular-serrate, like the inner bud-scales, often becoming bright red before falling; calyx-tube broadly obconic, glabrous, the lobes broad, acute or acuminate, laciniately glandular-serrate, reflexed



after anthesis; stamens 10; anthers pale yellow; styles 3 or 4, surrounded at the base by a narrow ring of pale tomentum. Fruit erect, in few-fruited clusters, globose to subglobose or slightly obovate, about 1<sup>cm</sup> in diameter, dark green until late in the season, becoming dark clear red when fully ripe; calyx prominent with a broad deep cavity, a short tube, and spreading mostly persistent acuminate lobes often serrate above the middle; flesh thin, greenish, dry and mealy; nutlets 3 or 4, thick, acute at the ends, prominently ridged on the back, with a broad often deeply grooved ridge, 7–8<sup>mm</sup> long.

A tree-like shrub with stems sometimes 3–4<sup>m</sup> in height and stout zigzag branchlets, light olive-green and glabrous when they first appear, dark purple or reddish-brown and marked by numerous small oblong pale lenticels during their first season, and dark gray-brown in their second year and armed with many slender chestnut-brown or purple spines usually pointed toward the base of the branch and 5–6<sup>cm</sup> long. Flowers the middle of May. Fruit ripens in October and falls before the leaves.

Common along woody borders, often in rocky soil. Rockford Park, Wilmington, October 1899, May and October 1900 and 1901, *W. M. Canby*.

This thorn, which is common in northern Delaware, is closely related to *Crataegus Boyntoni* Beadle, of the southern Appalachian region, differing from that species only in its smaller flowers on more slender pedicels, in its fewer-flowered corymbs, in its rather thinner leaves, and in the different color and size of the fruit which is inclined to be short-oblong or obovate.

***Crataegus cuprea*, n. sp.**—Glabrous. Leaves ovate to rhombic, acute or acuminate at the apex, gradually or abruptly narrowed and concave cuneate or full and rounded, or on vigorous shoots sometimes slightly cordate at the entire glandular base, sharply and often doubly serrate above with nearly straight gland-tipped teeth and divided into 2–4 pairs of short acute lateral lobes; nearly fully grown, membranaceous and pale green when the flowers open, at maturity thin but firm in texture, dark yellow-green on the upper surface, pale on the lower surface, 5–7<sup>cm</sup> long, 3.5–5.5<sup>cm</sup> wide, with prominent midribs and few remote primary veins extending to the points of the lobes; petioles slender, usually wing-margined above, glandular with stipitate dark red glands often deciduous before the autumn, 1.5–2.5<sup>cm</sup> long. Flowers about 1.2<sup>cm</sup> in diameter, on short often glandular pedicels, in 3–5-flowered compact compound thin-branched corymbs; bracts



and bractlets conspicuous, oblong-obovate, acute, or rounded at the apex, coarsely glandular-serrate, tinged with red; calyx-tube broadly obconic, the lobes elongated, abruptly narrowed from broad bases, enlarged, foliaceous and glandular-laciniate above the middle, mostly entirely below, reflexed after anthesis; stamens 10; anthers pale yellow; styles 3 or 4. Fruit subglobose to short-oblong, often somewhat narrowed at the base, when fully grown at first green, then russet or copper color, and at maturity sometimes dull red, marked by few large dark dots, 1<sup>cm</sup> long, 8 or 9<sup>mm</sup> wide; calyx prominent, with a broad shallow cavity and spreading lobes coarsely serrate above the middle and often wanting from the ripe fruit; flesh thin, dry, yellow-green; nutlets 3 or 4, thick, rounded at the ends, prominently ridged on the broad rounded back, 7–8<sup>mm</sup> long.

A low-branched stoloniferous shrub sometimes 2<sup>m</sup> high, with slender branchlets, green tinged with red when they first appear, bright red-brown, lustrous and marked by numerous large oblong pale lenticels during their first season, and dull reddish-brown in their second year, and sparingly armed with straight stout bright red-brown lustrous spines 3–4<sup>cm</sup> long, or unarmed. Flowers about the 20th of May. Fruit ripens early in October.

Vacant lots, Wilmington, Delaware, September and October 1899, May 1900, *W. M. Canby*.

#### PUNCTATAE.

*CRATAEGUS PUNCTATA* Jacquin.—Banks of Brandywine creek below Smith's Bridge, May 1869; banks of White Clay creek below Stanton, 1902, *W. M. Canby*.

#### MOLLES.

*Crataegus Tatnalliana*, n. sp.—Leaves ovate to oval, acute, broadly cuneate, or on leading shoots rounded or rarely cordate at the entire base, divided above into short acute lobes and coarsely and usually doubly glandular-serrate; as they unfold light green and covered above with short lustrous white hairs, rather paler below and villose along the midribs and primary veins; at maturity membranaceous, dark yellow-green and scabrate on the upper surface, paler and glabrous on the lower surface with the exception of a few scattered hairs on the slender yellow midribs and 5 or 6 pairs of thin primary veins extending



to the points of the lobes, 8-10<sup>cm</sup> long, 5.5-6<sup>cm</sup> wide; petioles slender, at first villose-pubescent, soon glabrous or rarely puberulous at maturity, 2.5-3<sup>cm</sup> long; stipules spatulate, acute, conspicuously glandular-serrate, caducous, or on vigorous shoots foliaceous, full and rounded below, acuminate at the apex. Flowers 2<sup>cm</sup> in diameter, in compact ultimately lax slender-branched many-flowered compound corymbs; bracts and bractlets foliaceous, oblong-obovate, acute or short-pointed at the apex, coarsely serrate, their teeth tipped with large bright red glands; calyx-tube broadly obconic, thickly coated like the short slender pedicels with long white hairs, the lobes acuminate, serrate, with elongated teeth tipped with red glands, dark green, slightly puberulous particularly along the lower side of the prominent midvein; stamens 10; anthers large, white; styles 3 or 4, surrounded at the base by a broad ring of white tomentum. Fruit in few-fruited drooping puberulous corymbs, globose, obovate or rarely oblong, full and rounded at the ends, bright orange-red, marked by large pale dots, puberulous toward the base, 1.5-2<sup>cm</sup> long, 1-2<sup>cm</sup> wide; calyx cavity broad and deep, the lobes gradually narrowed from broad bases, acuminate, coarsely serrate usually only above the middle, puberulous, bright red on the upper side toward the base, closely appressed or rarely erect and incurved; flesh thick, yellow, dry and mealy; nutlets 3 or 4, thin, acute at the narrow ends, very irregularly ridged on the rounded back, 7-8<sup>mm</sup> long.

A shrub 4 or 5<sup>m</sup> high, with numerous stout stems forming a broad head, and thick slightly zigzag branchlets at first villose, soon glabrous, dark red-brown, lustrous and marked by numerous large oblong white dots during their first season, becoming ashy gray and lustrous during their second year and ultimately darker, and armed with stout straight or slightly curved bright chestnut-brown shining spines 4-5<sup>cm</sup> long. Flowers during the first week of May. Fruit ripens from the middle to the end of August and soon falls.

Hedge rows and wood borders. Near Newport, August 1899, May and August 1900; between Newport and Newcastle, September 1899 and 1900, *W. M. Canby*.

Well distinguished from previously described species of the Mollis group by the peculiar hairs which cover the calyx and pedicels of the flower, the large foliaceous bracts and bractlets of the corymb, by the foliaceous calyx-



lobes, and by its habit. This common Delaware species may be fittingly associated in its name with Edward Tatnall, the author of the *Catalogue of the Phaenogamous and Filicoid Plants of Newcastle County, Delaware*.

## LOBULATAE.

CRATAEGUS ARCTUATA Ashe, Ann. Carnegie Mus. 1:387. May 1902.—I doubtfully refer to this species, on the strength of the published characters, a common thorn of Newcastle county, Delaware, and of Bucks county, Pennsylvania. *Crataegus arctuata* is a large shrub or small tree with broad ovate acute membranaceous leaves divided into numerous short acute lateral lobes, flowers in wide many-flowered villose corymbs with 5–7 stamens and red anthers, and short-oblong subglobose fruit ripening toward the end of August and soon falling.

Hedges near Wilmington, May and September 1899; near Newport, May and August 1900; hedges near Wilmington, May 1900; fields south of Eden Park, May and October 1900, *W. M. Canby*; Pennsylvania, Sellersville, Bucks county, May, September and October 1901, *C. D. Fretz*.

The name *arctuata* was used in 1886 by Gandoger in his *Flora Europae* for one of his proposed species of his genus *Oxyacantha* (*Crataegus Oxyacantha* Linnaeus), but as Gandoger's names can hardly be taken up by botanists it does not now seem worth while to make a new name for Mr. Ashe's species.

## TENUIFOLIAE.

CRATAEGUS TENELLA Ashe, Ann. Carnegie Mus. 1:388. May 1902.—Although I have been unable to see an authenticated specimen of the *Crataegus tenella* of Ashe described from material gathered in Delaware county, Pennsylvania, I refer provisionally, at least, to that species the common thin-leaved shrubby thorn of eastern Pennsylvania and Newcastle county, Delaware, with 5–7 stamens, pink anthers, and oblong or rarely pear-shaped bright scarlet lustrous fruits, with soft pulpy flesh, ripening early in September and often remaining on the branches until October.

Du Pont woods near Wilmington, September 7, 1899; border of marsh between Newport and Stanton, September 9, 1899; Newport, May 14, 1899; banks of Brandywine creek below Smith Bridge, May 16, 1899, *W. M. Canby*; Pennsylvania, Delaware county, woods below Castle Rock, May and September 1901; near Upper Darby, October 1901, May 1902; hill south of Castle Rock, May 1902, *B. H. Smith*; Bucks county, near Sellersville, September 1899, May and September 1901; near Telford, June 1899, *C. D. Fretz*.



*Crataegus stolonifera*, n. sp.—Leaves ovate-oblong, acuminate, rounded, truncate or sometimes slightly cordate at the broad base, more or less deeply divided into four or five pairs of acute or acuminate lobes, coarsely and often doubly serrate, with straight or incurved glandular teeth; as they unfold suffused with red and villose above, with long pale caducous hairs; at maturity thin but firm in texture, glabrous, dark yellow-green on the upper surface, pale on the lower surface, 4.5–6<sup>cm</sup> long, 3–4<sup>cm</sup> wide, with slender midribs slightly impressed above and 4 or 5 pairs of remote primary veins extending to the points of the lobes; petioles slender, slightly grooved, at first glandular, with numerous small dark deciduous glands, often red below the middle, 1.5–2<sup>cm</sup> long; stipules linear, acuminate, finely serrate, bright red, caducous. Flowers 1.5<sup>cm</sup> in diameter, in compact mostly 5–10-flowered thin-branched glabrous compound corymbs; bracts and bractlets oblong-obovate to linear, acuminate, finely glandular-serrate, bright red, caducous; calyx-tube narrowly obconic, the lobes acuminate, entire or slightly serrate toward the apex, often red toward the base, reflexed after anthesis; stamens 5–7; anthers small, dark red tinged with purple; styles 3 or 4, surrounded at the base by a narrow ring of pale tomentum. Fruit in few-fruited drooping clusters, usually on short pedicels, short-oblong to subglobose, scarlet, lustrous, 1–1.1<sup>cm</sup> long; calyx cavity broad and shallow, the lobes gradually narrowed from broad bases, acuminate, mostly entire or sparingly serrate, red on the upper side toward the base, closely appressed; flesh yellow, thick and succulent; nutlets 3 or 4, thick, narrow and acute at the ends, prominently ridged on the back, with a thin high ridge, 7–8<sup>mm</sup> long.

A shrub 2–3<sup>m</sup> tall, with numerous stems spreading into broad thickets and slender slightly zigzag branchlets olive-green tinged with red when they first appear, dull red-brown during their first and olive-green during their second year, and armed with numerous stout slightly grooved bright chestnut-brown spines 3–5<sup>cm</sup> long. Flowers from the 10th to the middle of May. Fruit ripens early in September and soon falls.

Rocky hillsides and the borders of swamps in rich moist soil. Between Newport and Stanton, May and September 1899; Clayton street and Delaware avenue, Wilmington, May and September 1899 and 1900, *W. M. Canby*;



Pennsylvania, meadows near Sellersville, Bucks county, May and October 1901, September 1902, *C. D. Fretz*.

In the shape, texture and color of the leaves this handsome species resembles the New England *Crataegus pastorum* Sargent, but differs from it in its smaller number of stamens and in its much larger subglobose earlier ripening fruit, and in habit.

PARVIFLORAE.

CRATAEGUS UNIFLORA Moench.—Not common.

CRATAEGUS CORDATA Aiton and the Old World CRATAEGUS OXYACANTHA Linnaeus are sparingly naturalized in Newcastle county.

ARNOLD ARBORETUM,  
Jamaica Plain, Mass.